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ABSTRACT

This document describes the design, operation, and field-testing of an innovative model for undergraduate teacher education at West Virginia University. Emphasizing the need for students to translate cognitive learning into performance at the time each concept is first acquired, the model incorporates such innovative modes of instruction as the specification of performance objectives, mediation of content, student interaction with instructional material, remedial loops to encourage mastery, feedback systems on student performance, and a more effective motivational system. Central to the operation of the model are: the Learning Center (an instructional laboratory which houses mediated instructional units based on the content of foundation courses) and the Auto-tutorial Audiovisual Laboratory (which provides students with skills for operating six to ten instructional machines and establishes performance criteria which must be met before the student begins instruction in the Learning Center). Other components include the controlled teaching laboratory (which permits students to bring each concept learned to a performance level through microteaching techniques); field experience (which may begin after three basic units of instruction and involves such activities as tutoring and serving as teacher aide); tutorial and small group seminars; and student teaching. Flow charts recording student progress and level of achievement and the results of a post-course measure of student attitudes toward 32 elements of the program are included with the document. (JES)

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A PERFORMANCE CURRICULUM IN UNDERGRADUATE TEACHER EDUCATION

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The usual undergraduate teacher education program is designed from a model which assumes that the beginning student should complete a series of foundation courses before entering courses in methods and experiences in student teaching. Theoretically, the function of required foundation courses is to provide the student with a body of knowledge about principles of learning, child and adolescense development, and procedures of measurement and evaluation. Supposedly, the content from these courses are to serve as a basis for methods in teaching and actual classroom practice which follow after completion of the foundation courses. This model can best be referred to as a vertical approach to instruction with the inherent assumption being that the student must first acquire a body of knowledge which is then translated into practice at some later time.

This model with the typical undergraduate teacher education is illustrated in Figure 1.

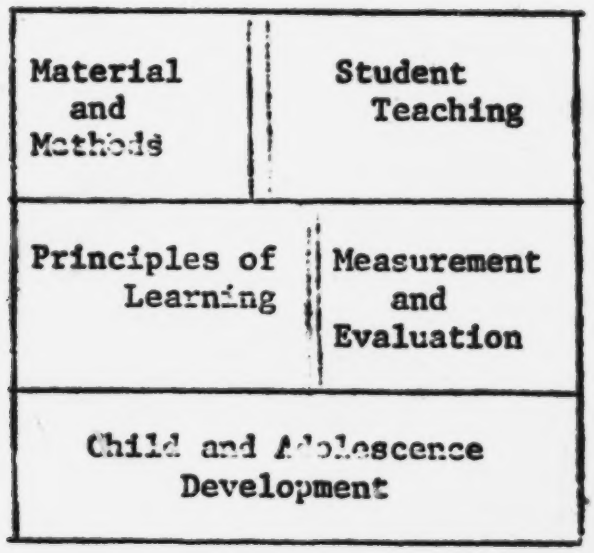

Figure 1. Representation of Vertical Design for Undergraduate Teacher Education

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Ryan,[1] in his examination and discussion of the professional education model, referred to the early foundation courses and subsequent practice as two distinct categories of experience. The foundation block is the professional sequence Ryan labelled as exposure experience and the student teaching block as total immersion experience. More importantly, however, Ryan identifies and raises in his investigation the more significant issue of the relationship between classroom oriented exposure experiences and the immersion experiences in student teaching. After a comparison of the professional education model with others, Ryan concluded that, "Much of teacher training is ineffective because it is based on a rather doubtful model." Ryan's basic criticism of the model centers on the lack of a tight relationship between the content of individual lessons and the task which the teacher will be called upon to perform. Any attempt to improve teacher education, then, would require starting with a new and more effective model. Attempts to patch an ineffective model would have been fruitless.

An experimental situation at West Virginia University provided an opportunity to formulate a new model and field test its effectiveness. The one theme directing the development of the model was that it should incorporate basic principles of learning in all its aspects and operations. While the theme was carried out in many phases of its operation, the rationale of the model was perhaps best stated in the writings of Woodruff.[2] Particularly important was Woodruff's discussion of the necessity for a trial stage in concept acquisition and validation. Woodruff expresses the point in this way.

> From this discussion process, which is typical of much classroom talk, the individual can have a concept which satisfies an achievement-test question, but which may not enable him to carry out an adjustmental act in a real situation. That is, he "knows" something, but he cannot make it work when he tries to act on that knowledge... In operant-conditioning terms, environmental control of behavior is being established and inappropriate responses are being eliminated.

Woodruff goes on to point out that, "School learning is generally deficient in the trail stage of learning and thus tends to have little direct transfer value. Formal education tends to emphasize discussion about concepts and to deemphasize empirical concept validation."

A study of undergraduate students in teacher education demonstrates the validity of Woodruff's observations.[3] This study, done at West Virginia University, compared the performance of students on a paper-pencil text at the end of an instructional unit with their ability to apply the principles learned in a controlled teaching laboratory. The outcome was a .06 coefficient of correlation between the paper-pencil performance and the task performed in the controlled laboratory. Such results demonstrate no relationship between what the student "know" and what he is able to put into practice in a given situation. The implication for instructional design is that transfer from knowledge level to behavior must be deliberately planned for in an instructional system.

Specifically, then, what was called for in order to offset the deficiencies in teacher education, was a model which permitted the student an opportunity to translate his cognitive learning into performance at a time when the concept was first acquired. It is this kind of direct relationship which makes the concept meaningful and practical to the student. Herein, too, is the real meaning of relevancy in instruction.

The model adopted from the above rationale provided not only an opportunity for the student to carry each concept acquired to a performance level, but it also offered an opportunity to experiment with different modes of presenting material and more flexible modes of instructional design. The model is illustrated in Figure 2.

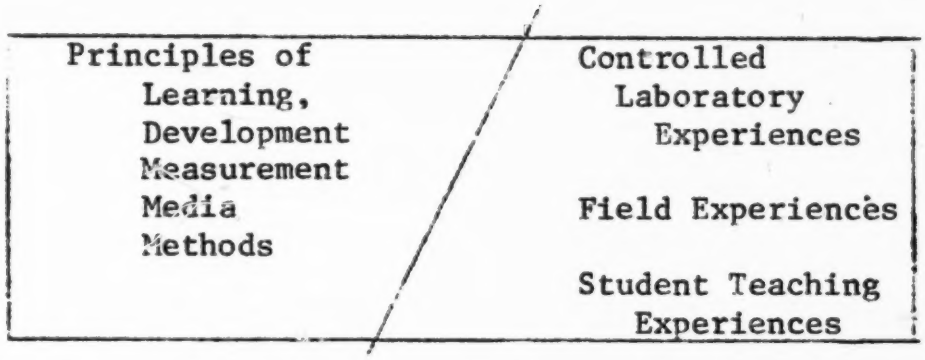


Figure 2. A Performance Model for Teacher Education

The model as implemented in the undergraduate program at West Virginia University incorporated several other innovative modes of instruction including the specification of performance objectives, mediation of content, student interaction with instructional material, flexible scheduling with some individualized instruction, remedial loops to encourage mastery, feedback systems on student performance, and a more effective motivational system.

The model, as operationalized, is represented in Figure 3.

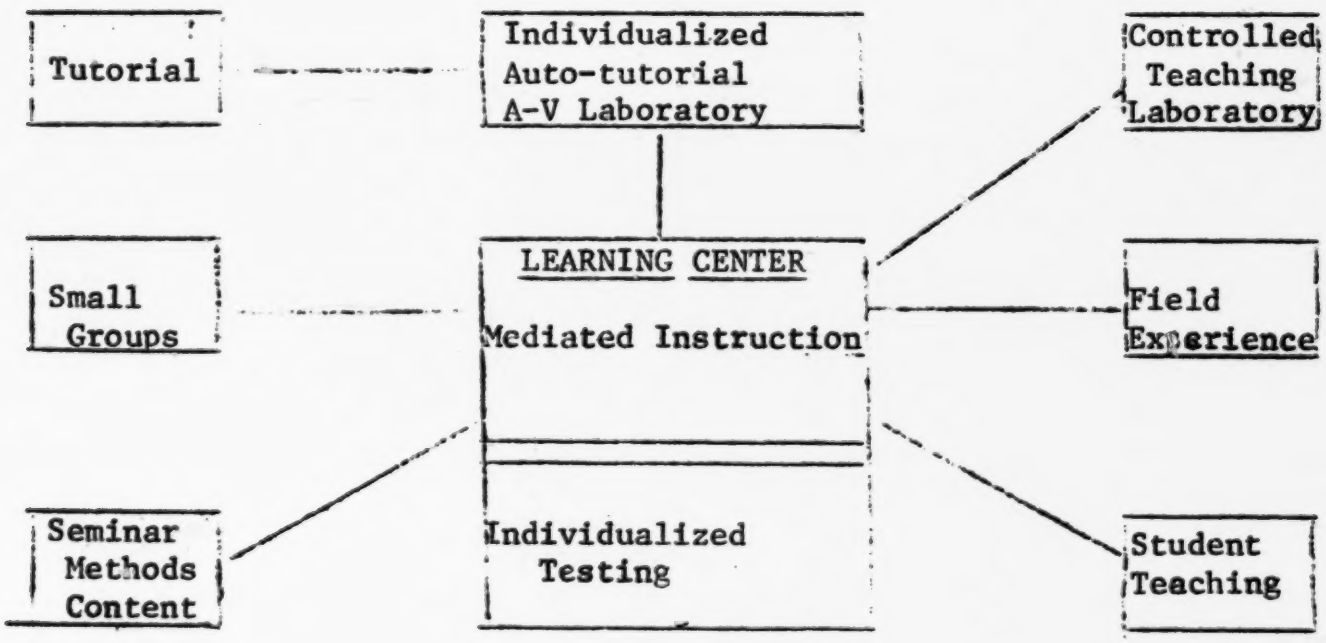


Figure 3. Operational Model for a Performance Curriculum in Teacher Education.

Auto-tutorial A-V Laboratory

All students have an early experience in the auto-tutorial A-V Laboratory. The function of this lab is to provide students with the skills for operating six to ten instructional machines. These skills are essential to the operation of instructional equipment in the Learning Center. Thus, students acquire basic skills in machine operation which are then maintained through the operation of equipment in the Learning Center.

The laboratory consists of a series of individual stations each with a basic machine. Each station is supplied with programmed materials to assist with the instructional phase of the operation. Students move through programmed material to the actual operation of equipment. In each case, performance criteria are specified. Students are checked out as they reach proficiency in operation of the machine. A student must have reached performance level and be certified to operate the machine before he can receive instruction through mediated programs in the Learning Center.

Learning Center-An Instructional Laboratory

The content from the basic foundation courses has been organized into instructional units and mediated for presentation in the Learning Center. Mediation has been accomplished by using audio and video tape, filmstrips, slides, and films. Instructional units include performance objectives, a pre-test, recommended instructional activities and post-test written over the objectives for the unit. Mediated presentations are accompanied by student response sheets and a short check-out quiz. After completing a series of instructional activities, the student may request a criterion test. A performance of 90 per cent is required on the criterion test for a grade of "A". A student falling below this level of performance has the option of taking the lower grade or retaking the test after he has completed a

remedial loop in the instructional sequence.

The Learning Center provides considerable opportunity for individualizing instruction if individualization is taken to mean that one receives appropriate material at a time when he is ready for it. Most of the material presented is related to other activities, but one may go through the instructional sequences at his own rate.

Controlled Teaching Laboratory

The function of the controlled teaching laboratory is to permit students to bring each concept learned to a performance level. Each unit of instruction presented in the Learning Laboratory is accompanied with a task to be performed in the teaching laboratory. As the student is ready to teach, he schedules time in the laboratory situation with a learning team consisting of five classmates. The teaching session is video-taped and critiqued according to specified criteria. If the students' performance does not reach criterion level, he may, after practice, repeat the performance.

Field Experience

Field experience is started after a student has completed three basic units of instruction or one semester of course work. The field experience may take the form of teacher aid activities, assisting in a tutorial program, or instructing in other educational settings. This experience is related to further instructional material presented in the Learning Center.

Tutorial and Small Group Seminars

Tutorials or small group seminars are used in a flexible manner throughout the entire program. These experiences usually begin as tutorials with instruction in the Learning Center than becoming discussion groups or teaching teams in later phases of the program. Seminars related to methods and subject matter areas accompany student teaching.

Student Teaching

Presently, student taaching centers are being developed in population centers around the state. Greater responsibility for this phase of the program is being assumed by the public school system where centers are being established.

With the use of controlled teaching laboratories and field experiences, students are not suddenly immerged in a student teaching situation but brought to it gradually. Consequently, they are more prepared to assume a greater role in handling classroom activities.

Student Achievement

In addition to the attempt to bring all concept learning to a performance level, a goal of the Learning Center has been to individualize and maximize student learning. Behavioral objectives were used with all mediated presentations. A mastery level was set at 90 per cent on all criterion test for a grade of A. An examination of student achievement over one semester (second semester 1968-69) shows a skewed distribution toward the mastery direction. These data are presented in Table 1.

Table 1. Distribution of Grades

	A (90%)	B (80%)	C (70%)	D (60%)	F (50%)	Incom-plete	With-draw	Total
Frequency	89	38	7	0	17	70	38	259
Per Cent	34.3	14.6	2.8	0.0	6.6	26.9	14.9	100

The grades above are for 259 students in the beginning course during the Spring Semester 1968-69. Of this number, 151 students or 58 per cent finished the course by the end of the semester. A few students actually completed all work before the semester ended while 70 students, or 26.9 per cent, elected to take an incomplete at the end of the semester in order to complete the course with a higher grade. These data would suggest that achievement when approached in

this manner is more a function of time than it is the task to be performed. In fact, the distribution of students by time begins to approach the normal distribution with some students finishing early, most at the close of the semester, and others continuing beyond one semester.

The number of students reaching mastery (34.3 per cent at 90 %) would indicate that students do prefer the higher grade when given the opportunity to achieve it. Grades would appear to be an effective means of motivation when students are permitted the opportunity to earn them.

One disturbing figure might be the number of students, 38 or 14.9 per cent, who withdrew from the course during the semester. Two factors may account for the high number. First, students were required to learn new behaviors rather than attending class three days per weeks. In the beginning students had difficulty learning the behaviors expected of them. Secondly, many students were unable to assume the responsibility for their own learning. These students demonstrated little or no progress and, consequently, were so far behind they elected to withdrew from the course.

Figure 4 presents a flow-chart of the progress of students through the course indicating check points and per cent of achievement.

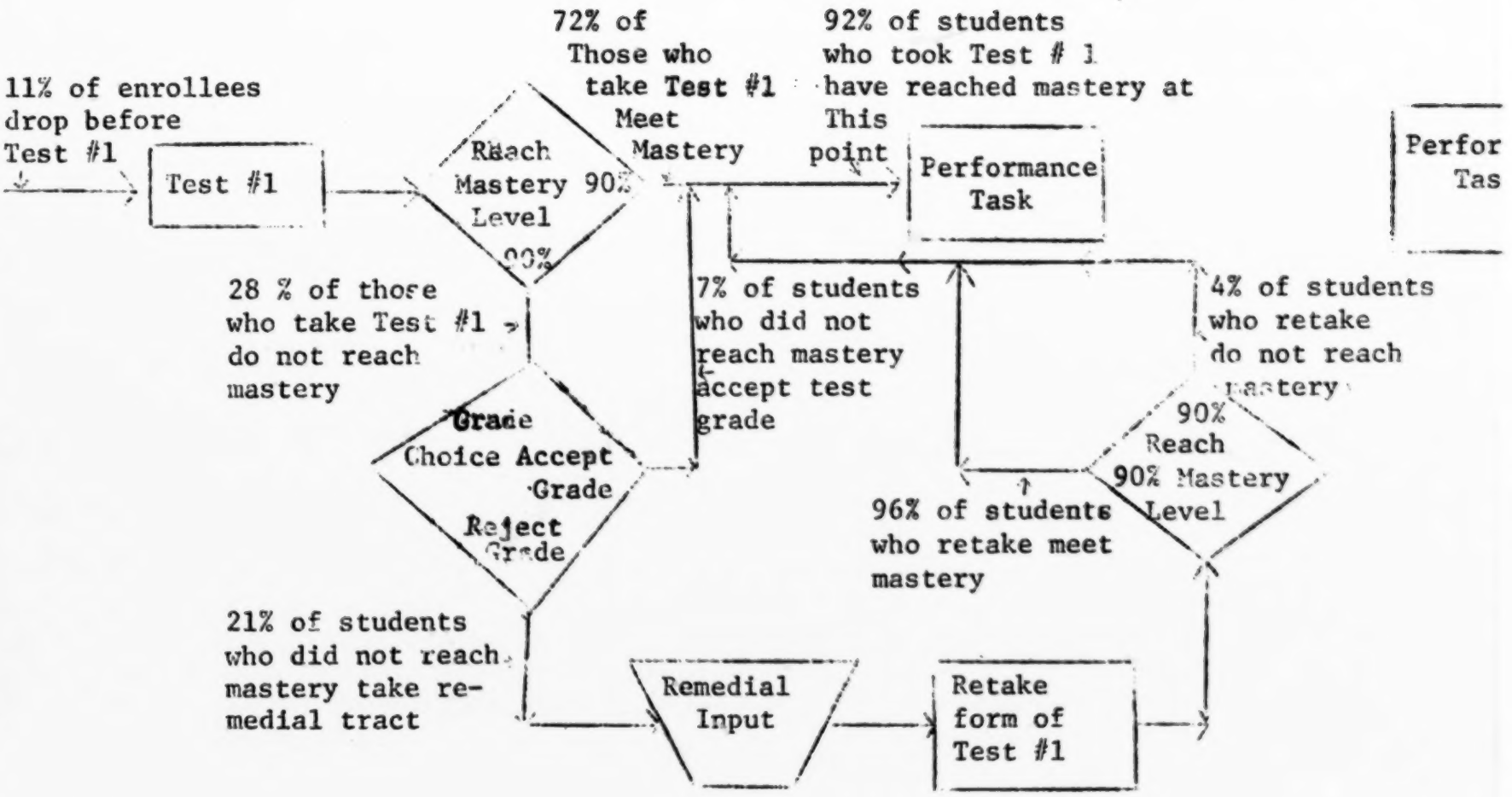
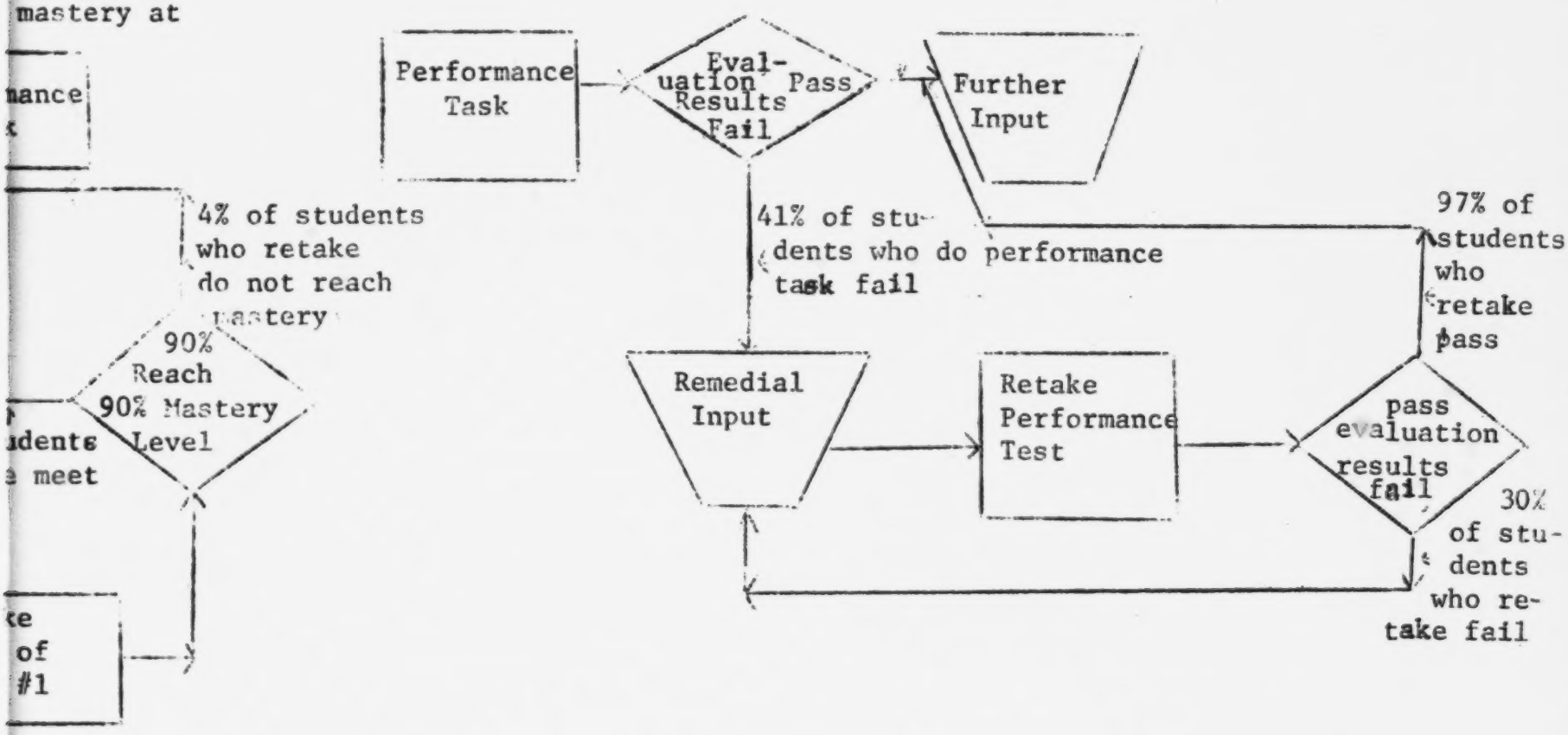

11% of enrollees drop before Test #1
Test #1
Reach Mastery Level 90%
72% of Those who take Test #1 Meet Mastery
92% of students who took Test # 1 have reached mastery at This point
Performance Task
Perfor
Tas
28 % of those who take Test #1 do not reach mastery
7% of students who did not reach mastery accept test grade
4% of students who retake do not reach mastery
Grade Choice Accept Grade
Reject Grade
90% Reach 90% Mastery Level
96% of students who retake meet mastery
21% of students who did not reach mastery take remedial tract
Remedial Input
Retake form of Test #1

FIGURE 4. FLOW-CHART OF STUDENT PR



4. FLOW-CHART OF STUDENT PROGRESS

Student Critique

A critical consideration in the success of any innovative program is the attitude of participants toward the program. An attitude measure was administered to students at the close of the semester in an effort to tap this phase of the operation. The scale asked students to rate 32 aspects of the program on a 5 point scale from dislike very much to like very much. A portion of rated variables are shown in Figure 5.

Total Number of Points		Questions Asked
38.53	363	- Lectures by audio tape
40.34	380	- Visual slides without audio tape lecture
41.40	390	- Writing programmed instruction
43.74	412	- Fill in and essay questions on exams
45.01	424	- This course in general compared to a regular college class meeting 3 times a week.
45.33	427	- Material presented by automated instruction versus presentation by teacher.
46.60	439	- Films on operant conditioning
47.77	450	- Lectures by video tape
49.04	462	- Lectures by audio tape with visual slides
50.64	477	- The Case II Tape and Slide presentation

51.38	484	- Worksheets on behavioral objectives
51.91	489	- Lab exams
52.87	498	- Criterion test covering specific objectives of unit
53.08	500	- Writing behavioral objectives
53.18	501	- Films
53.61	505	- Mager's Writing Instructional Objectives
54.98	507	- Teaching an objective Taking test at testing sessions
54.99	518	- Teaching a discrimination and generalization task
55.52	523	- Organization of course by units
55.63	524	- Teaching an instructional objective
57.54	542	- Active involvement sheets & Lab programs
59.55	561	- Play back of video tape
60.30	568	- Flexible lab schedule
60.62	571	- Method of grading by performance instead of curve
63.38	597	- Short answer exams
64.97	612	- Having objectives passed out at the beginning of a unit.
65.61	618	- Opportunity to repeat material week after week
67.20	633	- Taking tests as you are ready for them.
69.21	652	- Being able to retake test

Figure 5. Results of Critique

The figures in the left hand column represent position on a 100 point scale. In this regard, a socre of 50 would indicate a neutral position. Scores below 50 are toward a negative direction while those above 50 would be positive.

The results indicate that students preferred performance task included in the course. Particularly, they liked having objectives and being permitted to go back through material and retake examinations. Most factors falling at the negative end of the continuum were those related to instructional materials used in the Learning Center. This would reflect the need to improve and update the kind of material.

1. Ryan, Kevin A., "Occasional Papers, National Commission on Teacher Education and Professional Standards, NEA, No. 2

2. Woodruff, Asahel D. "Cognitive Models of Learning and Instruction," 1 Instruction: Some Contemporary Viewpoints, Chandler Publishing Company, 1967.

3. Minor, John, "Use of a Controlled Teaching Laboratory As an Approach to Valid Classroom Tests" An unpublished paper, West Virginia University, 1969.